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ON THE CONCEPT AND MEASUREMENT OF RECIDIVISM - CURRENT PRACTICES AND SUGGESTED IMPROVEMENT

BY

STATISTICS DIVISION

Ministry of the Solicitor General of Canada

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M.A. RAHIM

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M.A. RAHIM
RESEARCH AND STATISTICS

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FOREWORD

The concept of recidivism, its quantification, and appropriate measurement techniques, are well known controversial issues.

The Statistics Division of the Ministry of the Solicitor General initiated a study on the subject, formed a project committee during April, 1981, and arranged to obtain the services of Dr. W.H. Hammond, formerly of the British Home Office.

The outcome is this report. It provides a synopsis of past studies, outlines the Ministry data bases and their potential uses; examines current practices of evaluating the extent of success or failure among the parolees; and finally develops a more defensible formulation of the concept and measurement of recidivism.

It is believed that this study will help to provide innovative ideas and improve existing practices of describing recidivism, by the Ministry agencies and the crime and justice community in general.

Director
Statistics Division

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1. INTRODUCTION

1.1 OBJECTIVE: "Criminology usually defines recidivism as a falling back or relapse into prior criminal habits, especially after punishment" (Blumstein and Larson: 1971). Recidivism, understood in this context, is considered to be the most valued outcome measure for evaluating the correctional agency programs for offenders. However, its exact meaning, the inherent problem of quantification of the concept, and a rigorous formulation for its measurement which is operationally acceptable; remains unresolved. In fact, it is still believed that "recidivism is one of the least understood and elusive of measures employed in criminal justice research" (Paul Gendreau: 1976).

The main purpose of this study is to explain the various facets of the problem, examine different options and recommend the most suitable formulation for the measurement of recidivism, and illustrate its operational feasibility with reference to the Ministry data base. This task also required a review of the major studies in the area, the Ministry data bases, and current practices.

1.2 **NATURE OF THE PROBLEM:** Numerous studies have dealt with one or other aspects of the problem of measuring recidivism, notably by Glaser (1964), Mandel et al, (1965), Ackman and Normandeau (1968), Moberg and Ericson (1972), Martinson (1974), Gendreau (1976, 1978, 1979), Wainer (1981), and the "SEARCH GROUP" (Technical report no. 10, U.S. Department of Justice). These studies reveal that there is substantial agreement about what are the central problems which must be resolved:

(i) What exactly is the meaning of recidivism usually understood as "a falling back or relapse into prior criminal habits?" For example, to the police it would mean "rearrest", to the court "reconviction", and to a correctional agency "reincarceration".

(ii) Given that during the observation period an offender may have one or more relapses, should we count all relapses or only the first relapse?

(iii) Given that different offenders are exposed to different periods of risk, should we take into account differences in the risk periods for any formulation of a recidivism measure?

(iv) There is considerable variability in how long it takes for an offender to relapse. Some would argue - particularly from the point of view of correctional treatment - that the effect has been less pronouced the sooner the relapse. Should we, then, take into account the factor "time to relapse" as an important component of recidivism measure?

(v) Authors like Alexander et al. (1973), Jesness (1975), and Ross et al. (1976), dealing with correctional treatment investigation, have considered recidivism based on the all-or-none criterion of success and failure. Moberg and Ericson (1972), Martinson (1974), Gendreau (1976), as well as many others, consider that such a criterion is unsatisfactory and that "recidivism should be conceptualized as more than a binary classification". What they suggest is that one should take into account not merely the "relapse into criminal habit" but also the severity of the relapse. This poses another separate but related problem, namely, how to quantify or scale such a qualitative characteristic as severity. Scales developed by such authors as Sellin and Wolfgang (1964), Ackman and Normandeau (1968), Friedman and Mann (1976), Moberg and Ericson (1972), Martinson (1974), Gendreau and Leipciger

(1976), as well as by the Department of Corrections of the State of California - referred to as the "California severity of offence scale" - are all based on a rather subjective scoring system and are therefore considered by many to be unsatisfactory.

The last, but not the least of all problems, is that we lack an ideal body of longitudinal data containing all the required information about a well specified population of offenders. We can pose the problem, then, as the need to develop a meaningful indicator of recidivism, which answers the issues addressed and which can be achieved using existing data.

1.3 SCOPE: The lack of longitudinal data obtained by following up a sample/population of first offenders obviously sets limits on what we can do. To work with, we have certain data bases maintained and operated by the federal correctional system, and a few other systems under the provinces or territorial jurisdictions which are primarily designed for their own administrative and operational purposes. To assess the utility of various formulations of recidivism, we will first examine the kind of information retrievable from the federal correctional data system and illustrate the applicability of our formulation with reference to a population of offenders released conditionally, such as on full parole or mandatory supervision.

We are focussing, then, on "parole recidivism", but the method or formulation is perfectly general and can be applied to any other body of longitudinal data for the purpose of measuring general recidivism.

1.4 **REPORT STRUCTURE:** The report consists of five sections. Section 2 provides a synopsis of major recent studies.

Section 3 provides a description of the several Ministry data bases available for analysis.

Section 4 reviews current practices, focussing on the rate computed by the National Parole Board for assessing the extent of success of their parole decision making and various alternative rates suggested for measuring parole outcome.

Section 5 presents a generalized concept of recidivism designed to resolve the various controversies. It also presents a formula for the computation of an indicator of recidivism. The formula takes into account such factors as frequency of relapse, risk-period, time-to-relapse, and severity of relapse. Finally, the section illutrates the utility and operational feasibility of the formula by using longitudinal data on 3353 federal inmates released on full parole or mandatory supervision during 1976 and followed up to June 30, 1980.

2. SELECTED PAST STUDIES

2.1 **INTRODUCTION:** There is an extensive literature on the subject of recidivism. In this section we present the central ideas of selected major researches categorized into five areas:

(i) definition and measurement of recidivism;

(ii) recidivism as a function of time;

(iii) measurement of "severity" of recidivism;

(iv) effect of correctional programs on recidivism;

(v) other correlates of recidivism.

2.2 **DEFINITION AND MEASUREMENT OF RECIDIVISM:** Interest in the measurement of recidivism arises in several contexts such as the evaluation of correctional programs, the assessment of effectiveness of supervision while on conditional release, success in the decision making for conditional release, etc.

Individual recidivism is usually measured quite simply, as a success - failure dichotomy, with varying periods of observation. The criteria for failure are also variously

defined as re-arrest, re-conviction or re-incarceration. Such measurements are made in a population of offenders released conditionally or on reaching their warrant expiry date, by expressing the total number of offenders who had relapses into criminal behaviour as a ratio to the total number of offenders in the released population under concern.

Such a ratio or rate gives rise to a number of methodological and conceptual questions. Recent attempts to resolve these questions and make recidivism measures more objective are those of Blumstein and Larson (1971), Griswold (1978), and Rahim (1978). In the Canadian and Federal context the works of Atack and Davies also deserve attention.

Blumstein and Larson (1971) deal with the issue of whether re-arrest, re-conviction or re-incarceration is most suited to measuring recidivism. As is true of crime generally, it is not possible to observe directly all instances of recidivism. Accordingly, "surrogate" measures of the criminal act are used. The only available surrogates derive from the offenders' contact with the criminal justice system. Blumstein and Larson identify two types of errors that result from such measures: Type I errors, which arise from reporting as recidivists some individuals who are not, and Type II errors, which arise from not reporting individuals who do recidivate. Type II errors always exist if the measurement of recidivism is restricted only

to those individuals re-entering the criminal justice system. The balance between Type I and Type II errors will generally vary with the criteria used for recidivism. Relative to re-conviction, re-arrest will include more individuals who are innocent of any crime, but also more who are guilty.

To examine the practical implications of different measures of recidivism, Blumstein and Larson (1971) they consider the chances of an offender (a) committing a further crime, (b) being arrested for it, (c) being found guilty, (d) being convicted and (e) receiving a term of imprisonment. Each of these events represents a different frequency when it is used as a criterion of the incidence of recidivism. The authors, using what is known as the "Markov model" to simulate results, conclude that the choice of criterion makes a substantial difference.

Griswold (1978) also examines the implications of using different criteria for measuring recidivism. He not only uses various definitions of recidivism, but also uses various databases covering the same group of subjects (FBI database; state of Florida database; and self-report database). The FBI base provides alternative definitions of recidivism, including those re-convicted, re-incarcerated over thirty days, re-charged, or re-arrested. The Florida base includes only those re-incarcerated, while the self reported data includes

those re-incarcerated, re-booked and re-arrested. He compares the results in two ways. Griswold compares the number in the sample who are recidivists as measured by the different databases and definitions and concludes that the differences are indeed significant. Secondly, using regression to examine which variables are most related to recidivism he finds that age is consistently related to recidivism and the values of the regression co-efficients differ significantly between the two data bases.

Rahim (1978) studies the problems of quantification and measurement of recidivism following the recommendations of the SEARCH group to the United States Department of Justice that any measure of recidivism should take into account not merely the number of failures or relapses to criminal career, but also the length of time that expires before each relapse, and the "severity" of the relapse. Accordingly, he describes a procedure and formula by which one can compute and describe recidivism in terms of average number of relapses of the event per member of the population per unit of time he is exposed to risk, average time expiring before each relapse, and a measure of average severity of all those relapses. This set of three numerical figures is a summary of the performance of the population under study with respect to the "event" of falling

back to the criminal career. And, therefore, such a set of numbers can be used as an aggregate measure or index of recidivism. This approach is flexible in the sense that the user is at liberty to choose his event of interest as either re-arrest, or reconviction, or re-incarceration. The computed index of recidivism will then be different with regard to these different events of interest.

Davies discusses an appropriate definition of recidivism for use by the Correctional Service of Canada (CSC) in evaluating correctional effectiveness. He also notes a number of variations in the use of recidivism. In some instances, recidivism has been defined to include only offences of sufficient seriousness, offences of seriousness similar to that of the original offence, repeated offences, or offences committed within a certain interval of release from prison. Whatever the definition, statistical problems arise, including changes in law, unreported crime, police and prosecutional procedures that vary among jurisdictions. Davies suggests a definition of recidivism for the CSC that consists of convictions for additional offences that result in prison terms or during the extension of a current term. Thus, technical violations or parole revocations which do not result in a court conviction and prison term are excluded, as are any relapses that result in non-custodial sentences.

The essential point in Atack's paper is that there are serious technical and practical difficulties in measuring recidivism given the dictionary definition of a "recidivist" as "one who relapses into crime" (Oxford, 6th edition, 1976). What can be measured is "reconviction for an indictable offence" and "reincarceration to a federal prison". He therefore suggests that instead of using the term "recidivism rate", one should use "reconviction rate" or reincarceration rate". These terms have somewhat different meanings and implications. Reconviction includes cases of commitment to provincial prisons as well as some non-carceral sentences while reincarceration excludes these but includes summary convictions and technical violations of parole or M.S. that result in a return to a federal prison. Hence the two rates would have somewhat different uses. For both terms, it is possible to take into account length of time elapsed before the occurence of the relapse and the "severity" of the relapse.

Although Atack prefers to avoid the term "recidivism rate", he suggests that "reconviction" is a reasonable indicator of recidivism. Granted that conviction is a poor indicator of criminal activity (because of unsolved crimes, unreported crimes, lack of evidence to substantiate a charge, etc.) reconviction is a better indicator of criminal activity because:

(a) in solving crimes, police knowledge of criminal patterns and the whereabouts of offenders is a very significant factor;

(b) the more often a person has been convicted the more the police are likely to know about him;

(c) hence it is more likely that such an offender will be caught and convicted, and therefore counted for subsequent crimes;

(d) further, most offenders by the time of entry into a federal penitentiary have had several convictions.

2.3 RECIDIVISM AS A FUNCTION OF TIME: Given a body of follow-up data it is possible to tabulate the proportion or percentage of failures up to a time point t. We can then plot a graph showing those percentages of failures against different vlues of t. This graph provides us with a description and pattern of failures over time, so far as the particular body of data is concerned.

Some researches have been directed towards developing a mathematical formula of the form $y=f(t)$; where t represents a particular time point and y represents the percentage of

failures up to that time point t, such that a smooth curve drawn by using this formula closely fits the plotted graph of the observed follow up data. It is then assumed that the observed data have come from a population where the relationship between the percentage of failure y, and the corresponding time points t is given by the formula $y=f(t)$.

If this assumption is valid, then the formula itself provides the true description of the recidivism (i.e. distribution of failures over time). This formula is used to compute the probability that an individual will fail within a given time period 0 to t. This probability - a numerical figure - is then interpreted as a description of recidivism among the group followed up. Using these probabilities it is then possible to compare different groups, subjected to different correctional programs.

Recent, notable works in this area are those of Stollmack and Harris (1974), Maltz and McCleary (1977), Harris and Moitra (1978), Bloom and Singer (1979), and Wainer (1981).

It must be noted, however, that this approach, namely derivation of a suitable formula, depends on a number of initial assumptions or axioms. Stollmack and Harris (1974) derived a formual based on the assumptions:

(i) All individuals in the group under study will ultimately fail;

(ii) Each individual in the group has the same probability of failure;

(iii) The probability of failure does not depend on the length of time. In other words the probability of an individual's failure will remain the same over the entire passage of time under observation. (This is referred to as "constant failure rate" assumption).

The formula was used to test the effectiveness of half-way houses in Washington, D.C. One group consisted of 211 individuals released on parole after serving approximately six months in halfway houses under the District of Columbia Department of Corrections. The other group consisted of 185 individuals released directly on parole without spending time in halfway houses. The findings indicated that spending time in halfway houses did reduce recidivism. On the other hand by analyzing the same data based on the standard success/failure dichotomy, no significant differences in recidivism was found between the two groups.

Maltz and McCleary (1977) improved upon the Stollmack an Harris' formula by relaxing the assumption that all individuals in the group will ultimately fail. They assumed, instead, that there is some proportion of individuals in the group who will fail or recidivate; the remaining will not. This proportion, although unknown, can be estimated from the observed follow up data and is referred to as the "ultimate recidivism level". Under this less restrictive assumption they derived a formula and obtained a better fit to the observed data. They argued, therefore, that it is more appropriate to use their formula to compute the probability that an individual will fail within a given period of time t and use this probability for the purpose of comparing recidivism between two groups.

The Stollmack and Harris formula is well known in statistical literature as "negative exponential distribution". This formula is commonly used to describe and analyze the data relating to equipment failures over time. Maltz and McCleary used a slightly modified version of this formula which requires, as stated earlier, the assumption of "constant failure rate". There is another formula, well known in statistical literature as "Weibull distribution" which does not require this "constant failure rate" assumption. Hence, Harris and Moitra (1978) suggested the use of the Weibull distribution for the

purpose of describing recidivism which takes into account increasing or decreasing failure rates over time. They had also developed statistical methods to test whether the observed data is better fitted by this formula as compared to those used by Stollmack and Harris or Maltz and McCleary. They concluded that the Weibull distribution formula provided a better fit and demonstrated by using this formular that no significant difference in recidivism could be found between the experimental and control group under study.

Bloom and Singer (1979) studied the costs and benefits of the well known Patuxent Institution under the Maryland Department of Public Safety and Correctional Services. By benefit they meant reduction of recidivism among the inmates released from the Patuxent Institution as compared to those released from the standard institutions. They argued that the formula used by Maltz and McCleary suffered from certain "conceptual problems". Hence, they derived an alternative formula based on the assumption that the longer an inmate has remained successful "the greater is the confidence" in "his ability to remain so". In other words the probability that an inmate will recidivate becomes less and less with the length of time he has remained successful. They applied this formula to follow-up data on 106 Patuxent inmates paroled "from the institution for the first time in 1971 or 1972". Their finding was that the Patuxent group had significantly less recidivism as compared to that of 41 other inmates released from standard prison.

Wainer (1981) proposed still another formula which is an extension of Maltz-McCleary model for describing recidivism. He made the Maltz-McCleary "assumption that there are two groups of individuals in the parolee population of size N. Some number of them, say F, will recidivate, and N-F will not". In addition, he assumed "that the speed of recidivism is proportional to the size of the population left to recidivate". He claimed that even if his model "does not reflect the actual process of recidivisim" it can be used to "calculate a variety of potentially useful descriptive statistics". These might be peak recidivism rate, time of this peak etc. "These derived measures can be used to compare recidivism structures across different times and/or different locales".

Barton and Turnbull (1979) suggest a regression technique in which subjects' time-to-recidivism is explained as a function of correctional programs and of other potential correlates. He uses dependent variables such as the institution, previous offence, age, drug use, and monthly income. With his approach it is possible to test for the effectiveness of alternative programs without specifying the form of the underlying failure rate model. They studied the subjects paroled from two Connecticut institutions and obtained the maximum likelihood estimator for the coefficients. None of the estimated coefficients appeared to be significantly different for the two institutions. By comparison, several simple tests for

differences in re-arrest rates between the two institutions, taking no account of the covariates, indicated significant differences.

In conclusion, it may be mentioned here that the above approaches are based on the fundamental assumption that the observed follow-up data come from a hypothetical population that can be described by a mathematical formula or model. Therefore, a description of the process of recidivism in the observed data is equivalent to a description of the features ("parameters") of that mathematical formula. Theoretically, this approach is attractive and may serve the purpose very well for a given body of follow-up data which can be fitted closely by some particular formula. In real life situations, however, this approach leads to a number of problems: First, the nature of the intial assumptions required to develop the mathematical formula are highly controversial. Second, there cannot be any single unique mathematical formula capable of giving the best fit to any and every set of follow-up data. Third, the approach is intended to provided us with an idea of the "pattern" of recidivism observed over a given period of time. It does not tell us the degree or magnitude of recidivism ascribable to a group of inmates as a whole.

2.4 **MEASUREMENT OF SEVERITY OF RECIDIVISM:** The usual treatment of recidivism as a success/failure dichotomy largely omits any consideration of differences in seriousness of the offences associated with each failure which are summed up and compared.

Actually, the issue of seriousness scales has been a long standing concern in criminology with a view to measure criminality rather than simply recidivism. There is a sizeable literature specifically devoted to the measurement of severity of recidivism by assigning weights to offence types. But the main defect in this approach is that the weights are developed on a subjective basis and therefore the approach has always led to considerable controversies. Examples include Akman and Normandeau (1970), Figlio (1975), Lesieur and Lehman (1975), Blumstein (1974), Moberg and Ericson (1972), and Gendreau and Leipciger (1978).

Akman and Normandeau (1970) attempted to reproduce in Canada a scale developed by Sellin and Wolfgang (1964) in the United States to measure the seriousness of delinquency. This approach is based on categorization of each criminal event in terms of personal injury to the victims, theft of property, property damage and/or a combination of the three. Each category is further subdivided into 17 "elements", such as "minor injury to victim", "victim treated and discharged", "victim hospitalized", etc. and each element is then assigned a score value. Final

weights for offences are derived depending on the classification of them into one or more of the above three categories and the observed "elements" associated with the criminal event.

The actual scores were determined based on the opinion of a sample of middle class judges. Akman and Normandeau claim that different groups of judges provide scales which are broadly consistent and sufficient to justify the development of a national index of seriousness.

The validity and reliability of the Sellin-Wolfgang seriousness weights as well as its replication by Akman and Normandeau have been the subject of a number of other studies. Figlio (1975) studied the sensitivity of the scale of ratings by two distinct groups of individuals. One group consisted of a sample of offenders, namely, inmate population, while the other consisted of a sample of non-offenders, namely certain university students. The sample of students was essentially similar to those used originally by Sellin-Wolfgang, to ensure the stability of the index over time. Figlio concluded that the ranking of offences was very similar but the relative scores did differ substantially.

Lesieur and Lehman (1975) examined what they call the "internal validity" of the Sellin-Wolfgang scale. Using a sample of university students, they developed a scale and checked the closeness of rankings by individual judges and the aggregate

index. They concluded that the differences were sufficiently great to cast doubt on the validity of the aggregate index.

Blumstein (1974) investigated whether the Sellin-Wolfgang index did provide additional information in terms of criminality. He compared the trend of simple sum of several major types of offences in the St-Louis area to the Sellin-Wolfgang weighted index for the same offences. He concluded that one measure is virtually a linear function of the other. He tested the sensitivity of this conclusion to changes in the weights of the Sellin-Wolfgang scale and found that it remained true. Using the Sellin-Wolfgang scale requires a great deal of information available only from police reports rather than official crime statistics. Owing to this difficulty questions have also been raised if the scale is at all worthwhile from a practical point of view. The Blumstein study pointed out that convenience should be the determining factor for measuring aggregate criminality.

Moberg and Ericson (1972) developed a seriousness scale based upon the disposition of the offender. The scale assumed an ordinal progression of degrees of seriousness of offences classified into eleven categories ranging from felonies, misdemeanours, absconders, fines, to no record. The authors argued that "to the extent the penalties imposed for known offences are correlated with societies interpretation of their seriousness" the scale can be considered as a measure of recidivism.

With the aid of a number of experts, they assigned scores to different legal dispositions ranging from 0 to 10. They grouped the scores into classes denoting failure, marginal failure, marginal success, qualified success and success, where failure corresponds to recidivism. With this approach when they carried out independent rankings of the same group of subjects they obtained very similar results. Thus, they concluded that their scale is both reliable and valid.

The Moberg-Ericson scale possesses the advantage of being easier to construct than that of Sellin-Wolfgang, as it is based directly on judicial data. The scale can also be adapted to the laws of different jurisdictions.

Gendreau and Leipciger (1978) modified the Moberg-Ericson scale to make it suitable for Canadian data. They argued that the Sellin-Wolfgang scale "while conceptually interesting, had practical and theoretical limitations". They restructured the U.S. legal dispositions "to Canadian terms along a dimension of severity of disposition". Accordingly eight categories were redefined and failure rate was computed for each category. They applied their method to follow-up data of 802 male first incarcerates sentenced to Ontario provincial reformatory during 1970-72. The follow-up period was two years.

2.5 **THE EFFECT OF CORRECTIONAL PROGRAMS ON RECIDIVISM:** The effect of correctional programs on recidivism has been widely studied. In most cases, the intent is to evaluate the effectiveness of a program, using recidivism as a measure of success.

The program effectiveness is generally understood from the point of view of rehabilitation aspect. Little attention is paid to the fact that a correctional program has also a deterrent effect. Using a gross measure such as recidivism rate one cannot be sure if it actually demonstrates program success in terms of successful rehabilitation or successful deterrence or both. This constitutes a weakness of recidivism as a measure of program success, at least to the extent that rehabilitation as opposed to deterrence represents an objective of the correctional programs.

Evidence regarding the effect of correctional programs on recidivism has been the subject of several studies. Three of these recent studies are those of Brody, (1975) Greenburg (1977), and Gendreau and Ross (1979). Brody (1975) examined 65 studies, dating from the mid-1950's onward, all of which dealt with legal dispositions. Broadly, the studies evaluated sentences of the following types:

- time spent in custody
- different custodial treatments
- custodial vs. non-custodial treatment
- different non-custodial treatments

In all cases, Brody concluded that there was no evidence to suggest that correctional program can reduce recidivism. This is true both for studies of rehabilitative sentences and the less common studies of deterrent sentences like imprisonment.

Further, Brody pointed out that many of the studies were methodologically defective, making it all the more difficult to make any plausible conclusion. He identified several major shortcomings as follows:

- Comparability of samples: It is necessary to control for variables other than corrections which might affect any comparison between samples. Random assignment of offenders to one program or another to some extent obviates this difficulty. In the context of corrections, such assignment is rarely possible. The alternative, namely, to control for other variables, using statistical techniques, is difficult particularly because it is impossible to control all variables and it is also impossible to specify all of them correctly. Brody, however, concluded that only criminal experience, the number of previous custodial sentences, and age are consistently related to recidivism.

- Interaction effects: Adequate measurement of the effectiveness of programs also requires that joint effect of program and other variables be considered. This is

particularly true of offender characteristics. For example, if programs are compared on the basis of samples containing offenders of all ages, no difference in aggregate rates might be apparent. Comparisons of programs for young and adult offenders separately could indicate distinct differences in effectiveness.

- Integrity of treatment: It sometimes happens that the treatment program originally designed is not properly put into effect, especially when a pilot program is applied to a large population of offenders. It is necessary to be aware of this aspect when program evaluation is attempted.

- Measures of success and failure: The weakness of the usual measure of recidivism as a success-failure dichotomy is also an important factor that renders evaluation or comparison of different programs less reliable.

Greenburg (1977) made conclusions similar to Brody's. He examined the effects of:

- Early diversion
- The intensity of probation
- Imprisonment
- Probation with non-residential programs
- Unconventional institutions
- Parole
- Post-release programs

and found little consistent evidence that correctional treatment is effective in reducing recidivism, at least in the long run. Like Brody, he also noted that many of the studies suffer from methodological flaws. In addition, he criticized correctional programs, frequently lacking from any clear theoretical basis or presumption as to their effectiveness.

In a third review, Gendreau and Ross (1979) arrived at results which differed from those of Brody and Greenburg. They covered published studies of rehabilitation dating from 1973 to 1978. The types of treatment studied included:

- family and community intervention
- counselling
- diversion
- bio-medical assistance
- miscellaneous treatments.

Gendreau and Ross argued that 86% of these relatively well designed studies show at least some program aspects as successful.

They identified a number of characteristics that distinguish successful programs, namely:

- sufficient and effective treatment
- appropriate coordination among different agencies

- the use of several rehabilitative techniques
- a related point, flexibility to adapt a program to the needs of individual clients.

Hence, they concluded that more careful evaluative studies of program effects are worthwhile.

2.6 OTHER CORRELATES OF RECIDIVISM: These studies are concerned with the relationship between recidivism and variables, other than correctional programs.

Reconviction prediction methods have shown promise and the statistical techniques used to establish the determinants of recidivism have become increasingly sophisticated. Generally however, sophisticated techniques have not been consistently more successful than simpler ones in predicting recidivism. In fact the more sophisticated multivariate methodology does little better than the bivariate in this regard.

The variables which are found most consistently to be significant include measures of prior criminal record, age and, frequently, drug or alcohol dependency. In addition there is some evidence of a relationship between psychological scales and recidivism. Usually the variables used emphasize the character or history of offender. The variables that characterize a subject's family or community environment is also important although these are quite difficult to collect.

Important studies in these area are those of Hammond, (1974) Nuttall (1976), Gendreau, Madden and Leipeiger (1978), Larntz (1980), van Alstyne and Gottfredson (1978), and Andrews.

Hammond (1974) examined the evolution of criminal behavior and judicial disposition in Britain from 1957 to 1968. Generally, he observed a substantial increase in the total incidence of crime over the period. To an extent, this results from shifts in the age distribution of the population, though there is also evidence of more wide-spread criminality for a given age distribution. In most other respects, Hammond concluded, that the pattern of criminal behavior has remained largely unchanged. With some exceptions, this is true of the relative incidence of crime among age groups, patterns of recidivism for individual offenders and type of crime. He noted a marked change in the nature of judicial dispositions, with a rise in the frequency of immediate release, both in the form of discharges and fines. In addition, detection and clearance rates for crimes reported declined as the crime rate went up.

Hammond also investigated the determinants of recidivism, defined as reconviction, during the period using two samples of offenders, the first from 1957 and the second from 1968. These indicated that recidivism decreases with age and increases with the number of previous offences. Moreover, recidivism rises the earlier the age at which any criminal record is accumulated.

The studies indicated that the likelihood of recidivism is not influenced by the severity of sentence. Specifically, the greater use of immediate discharge in the later period and in regions outside London did not seem to affect the extent of recidivism.

Nuttall (1976) developed a method of predicting recidivism on the basis of certain "scores" assigned to prison releases who would later become eligible for parole. The scoring procedure was worked out from the records of 2276 male prisoners released in the first six months of 1965. The prisoners were divided into two groups of 1138 members randomly. One goup was used as the "construction sample" and the other as "validation sample". Sixteen "factors" or variables were chosen believed to have dependence relationship with recidivism. Each factor was divided into a number of sub-groups (Example: "Number of previous imprisonment" is a "factor". Sub-groups are: None, 1 to 4, 5, 6 to 14, 15 or more). The reconviction rate among the prisoners of the construction sample, classified under each factor and sub-group was computed. The overal reconviction rate in the construction sample was 54% and "a score of ± 1 was assigned for each 5% deviation" from it. Positive or negative scores were given depending on the deviation being higher or lower than 54%. A standard table was prepared showing each factor and the sub-group, and the corresponding score value. Thus total score for each prisoner was computed depending on the various factors (and the sub-groups) he was associated with. Then the frequency of the prisoners and the percentage of them

reconvicted for specific score intervals, was computed both for the construction and validation samples. The percentage distribution of reconviction was found to be similar in both samples. Hence both the samples were combined and the percentage of reconviction (i.e. reconviction rate), corresponding to a given score value was considered to be an estimate of the probability of recidivism.

The method, although very interesting and has "the virtue of simplicity and convenience", "has been critized, both on the grounds that it underestimates the extent of subsequent offending and, perhaps more important, that it fails to take account of the frequency and seriousness of reoffending".

Gendreau, Madden and Leipciger (1978) employed multiple regression, to explain recidivism in a Canadian context. The dependant variable was recidivism, measured as a dichotomy on reconviction following release. Regressors included social history variables and a number of psychometric variables. Three variables -- age at first appearance before court, birth outside Canada, and current drug offences -- appeared to be significant. A number of psychometric scales were also tested but these did not explain recidivism as well as the social history variables.

Larntz (1980) compared bivariate and multivariate methodologies in predicting recidivism among parolees, using data for the state of Minnesota. He tested the predictive power of what is

known as "logistic multiple regression" against certains scoring system on selected factors previously developed for that state. These factors are previous juvenile record, the number of parole or probation failures, the number of prior incarcerations, age at first adult conviction, previous convictions, education, current burglary offence, and prior felony convictions.

By using the same variables for multiple regression he found only two of the variables are significant: the number of previous parole or probation failures, and age at first conviction. His general conclusion was that the simple logistic regression model using two continuous independent variables was as good as any other model.

Van Alstyne and Gottfredson (1978) used what is known as "log linear analysis" to develop a logistic model of recidivism among parolees in Ohio. Generally, the log linear technique permits an investigation of all possible associations between recidivism and the hypothesized explanatory variables. They used four explanatory variables, namely, type of offence (property or not), age, prior record, and alcohol or drug dependency. The log linear model did not appear to be any better compared to other models. With such results van Alstyne and Gottfredson concluded that future research should concentrate less on increasingly sophisticated statistical techniques and more on better specification of the prediction and criterion variables.

Andrews reviewed the literature dealing with a number of issues relating to recidivism, in particular the psychosocial bases of recidivism. He pointed out the operational difficulties associated with the concept of recidivism, relevance of the follow-up period, and the definition of an offence. With respect to follow-up he stressed on the necessity of beginning follow-up at the initiation rather than at the termination of any program. In his opinion the length of follow-up is less important and noted that the effect of varying follow-up period to the validity of different predictors of recidivism is largely unexplored.

He discussed the appropriateness of the most common definitions of an offence. These include official records of rearrests, reconvictions or reincarcerations and, occasionally, self-reports by offenders. He concluded that choice in any particular application should be made on the basis of relevance. According to him the Sellin-Wolfgang scale is impractical and complicated and that the Moberg-Ericson scale requires standardization. In his opinion, severity of disposition such as time spent in prison, can be used as a simple measure of seriousness.

Finally, Andrews reviewed works on the psychological and social bases of recidivism and of crime in general. His views, in this connection, are relevant for the purpose of developing correctional programs best suited to reduce recidivism.

3. MINISTRY DATA BASES

3.1 **INTRODUCTION:** In this section we will describe certain computerized data bases maintained and operated by the Ministry Agencies. One, known as Offender Information System (OIS) is maintained and operated by the Correctional Service of Canada. The others, Finger Print Service (FPS) and the related data files under the Canadian Police Information Centre (CPIC) are maintained and operated by the RCMP. The design of these data bases and the items of information recorded are primarily for the administrative and operational requirements of the agencies concerned. Our purpose here is to give an overview of these data bases, identify the variables that can be used for computing recidivism among those who are conditionally released, and in particular examine the potential of FPS/CPIC data bases for the purpose of computing recidivism among those released on completion of their sentences.

3.2 **OFFENDER INFORMATION SYSTEM (OIS):** This is a computerized data base where specific information is recorded, maintained, and updated, about every criminal offender incarcerated in federal penitentiaries under the supervision of the Correctional Service of Canada. Currently, it maintains a file of information pertaining to all those criminal offenders in the Federal Corrections System incarcerated since 1970.

The data base is located in a central computer which is connected to the computer terminals located at the correctional institutions themselves, all over Canada. An authorized officer of an institution can directly type the offender information at the terminal and enter the same in the central computer. A printer located near the terminal will print out a copy of the completed form(s) so that the institution will have a copy of the offender information being input or changed. The terminals can also be used to retrieve the data.

It may be mentioned here that the two other data bases, previously known as National Parole Statistical Information System (NPSIS), and Temporary Absence (TA) program, have been integrated with the current Offender Information System. The NPSIS had provision for detailed information about parolees covering such areas as current offences and aggregate sentence, prior criminal history, case preparation, Parole Board decisions, parole violation status, case supervision status, etc.

For general information suffice it to state that the current OIS contains almost all the information needed either for computing or developing various outcome measures relating to parole decisions, mandatory supervision, or for long term follow-up studies to develop some appropriate measure of recidivism among the parolees.

For the latter purpose and the subsequent developments in this report, we need to specify and use only six variables listed and explained below.

1. INMATE IDENTIFICATION NUMBER: This is the Fingerprint identification number assigned by the RCMP to each person charged with an indictable offence where the fingerprint has been taken either by a police department or by an institution.

2. ADMITTING DATE: This is the date on which the inmate is received for admission to the penitentiary.

3. ADMITTING TYPE: This tells the basis of admission such as warrant of committal, transfer from provincial institution, parole revocation, parole forefeiture, etc.

4. ADMITTING MAJOR OFFENCE: This is the offence for which the offender is given the longest sentence when he is admitted. In the case of more than one identical sentence, the one regarded as the most serious, as measured by the maximum penalty allowed by the law. If each offence carries same maximum penalty, the first offence listed on the warrant of committal is regarded as the most serious.

5. RELEASE DATE: The date the inmate is released from the institution.

6. RELEASE TYPE: This identifies the nature of release, such as expiry of sentence, parole, mandatory supervision, death, transfer to provincial institution, etc. There are altogether 13 types.

For illustrative purpose, we provide a sample record of these data elements for 15 inmates released during 1976, either on full parole or under mandatory supervision, and followed up to June 30, 1980 (Tables 3.1 and 3.2). Such an output constitutes the basic data matrix and we will refer to it later on.

TABLE 3.1: AN ILLUSTRATION OF DATA ELEMENTS RETRIEVABLE FORM OIS SYSTEM

			1ST RELAPSE					2ND RELAPSE					3RD RELAPSE					June 30 1980
FPS ([1]) NUMBER	RELEASE DATE	RELEASE TYPE	ADMI-SSION DATE	ADMI-SSION TYPE	OFFENCE TYPE	RELEASE DATE	RELEASE TYPE	ADMI-SSION DATE	ADMI-SSION TYPE	OFFENCE TYPE	RELEASE DATE	RELEASE TYPE	ADMI-SSION DATE	ADMI-SSION TYPE	OFFENCE TYPE	RELEASE DATE	RELEASE TYPE	....
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	76298([2])	2																
2	76236	4																
3	76108	4	76309	4	18	77051	4	77082	4	6	77095	4	77245	5	8	79239	4	
4	76318	4																
5	76062	2																
6	76048	4	77067	1	11	78311	4											
7	76272	4																
8	76061	1																
9	76195	2																
10	76309	4	78016	4	11	78212	4											
11	76311	2																
12	76226	4																
13	76154	2	77157	3	11	78317	2	79057	2	11	79329	4						
14	76236	4	76298	5	12	77121	4	77204	5	13	78105	4	78209	5	12	79304	4	
15	76093	2																

(1) Actual FPS numbers not shown for confidentiality.
(2) Number like 76298 stands for 298th day of the year 1976 which is October 24.

TABLE 3.2: CODES USED IN TABLE 3.1

OFFENCE GROUP	CODE	ADMISSION TYPE	CODE	RELEASE TYPE	CODE
Murder	1	Warrant of committal	1	Expiry of sentence	1
Attempted Murder	2	Parole revocation	2	Full parole	2
Manslaughter	3	Parole revocation with indictable offence	3	Clemency, court order, etc.	3
Rape and attempted rape	4	MS revocation	4	Mandatory Supervision	4
Sexual assault	5	Ms revocation with indicatable offence	5		
Wounding and other assaults	6				
kidnapping, forcible confinement	7				
Robbery	8				
Criminal negligence causing death	9				
Other crimes against person	10				
Break and enter	11				
Theft, possession of stolen goods	12				
Fraud	13				
Miscellaneous criminal code	14				
Trafficking of narcotics	15				
Possession of narcotics	16				
Misc. Fed. & Prov. statutes	17				
Escape and unlawfully at large	18				

NOTE: The range of values of the variables and the codes shown here are for the purpose of simplified illustration of the data elements in Table 3.1. They are not necessarily the same as in the OIS coding manual.

3.3 **FINGER PRINT SERVICE (FPS) AND CANADIAN POLICE INFORMATION CENTRE (CPIC) DATA BASES:** Both these data bases under RCMP are operational systems and are primarily used as investigative aids. For general information we will briefly describe the nature and content of a number of components or data files that constitute these systems. We will then examine the potential of some of these informations for the purpose of measuring recidivism.

3.3.1 FPS MICROFICHE FILE: When an indidivual is charged with committing an indictable or dual (indictable and summary) offence the local police force takes his fingerprints and fills out a form, referred to as C216. If no previous record exists about the individual, an identification number is assigned to him (FPS number) and a "microfiche file" is created. The basic information content of this file are:

Finger print classification

Date of finger printing

Name, Date of birth, place of birth, height, weight, hair colour, next of kin (name and address)

Police force

Date of arrest and charge (description with or without section and statute)

There are three other related systems, in addition to this Microfiche File. Their names and basic information contents are listed below.

3.3.2 CRIMINAL NAME INDEX FILE:

FPS number
Name of the person
Aliases

3.3.3 CRIMINAL RECORDS SYNOPSIS (CRS):

FPS number
Date of opening the file
Sex
Race
Date and place of birth
Current age, colour of eyes, height, weight
Last entry by type of offence and aliases
Fourteen categories of offences (robbery, violence, offensive weapons, break and enter, vehicle theft, theft, drugs, fraud, sex, failure to appear, arson, driving offences, other criminal code, other federal statutes).

3.3.4 CRIMINAL RECORD-2 (CR2):

FPS number

Name and aliases

Date and place of sentence(s)

Charges by offence name, statute section, and the number of counts

Disposition/sentence

Date and place, charge and disposition

Parole information

Mandatory supervision information

Appeal information.

Records of all individuals fingerprinted after April 1, 1983, are entered in CR2 file. Records of first offenders with criminal activity before this date are not available in this file except for those who have had further criminal activity. By 1985, however, records of all first offenders are expected to be added to this system.

3.3.5 ADDITIONAL CPIC FILES: Along with the above three sub systems, the Canadian Police Information Centre maintains three additional files.

(i) Vehicles file:

Contains information about stolen vehicles like license plate, license validation tags, etc.

(ii) Boat and boat motor file:

Contains information about stolen, missing, abandoned boats or the boat motors.

(iii) Persons file:

Contains information about wanted persons.

(vi) Stolen property file:

Contains information about stolen property.

3.3.6 POTENTIAL OF FPS/CPIC SYSTEM: No doubt these data bases contain an wealth of information and are the only source for computing any general recidivism measure based on follow-up data for a group of individuals released on completion of their sentences; however, the extent of

its utility or potential depends very much on what exactly we want and how we define a number of basic concepts, such as -

(i) Definition of the group i.e. "population" for whom we want to compute a recidivism measure.

For example, we may want to compute recidivism for a group of first offenders belonging to one or more of the seven index offence categories as defined in the United States. These data would not be directly available from the FPS/CPIC system. Much reclassification and recoding would have to be done, with respect to the offence categories entered in the FPS/CPIC system before we could make any use of them.

(ii) Definition of the "event" whose occurrence is to be interpreted as "failure", or "relapse", or "falling back into prior criminal habits". Is it rearrest, reconviction, or reincarceration?

Although these variables are entered into the system the range of values of the same might have to be coded for the purpose of statistical aggregation.

(iii) Assume that "reconviction" is the event and its occurrence is to be interpreted as a "relapse". If this conviction happens to be imprisonment, how do we determine the time point or date of "relapse"? Is it the date when the judge passes the sentence or the date when the individual is physically admitted to an institution?

In the latter case the information would be readily available from the OIS system rather than from the FPS/CPIC).

(iv) If the conviction is payment of fine how do we define the time point or date of release in the society (i.e. exit from the criminal career)? Is it the day when he actually pays the fine?

This record of the date of exit would not be available from the FPS/CPIC). It would perhaps be recorded somewhere in the court system.

These and many other questions of this nature would have to be thrashed out before one can use the data bases and compute a measure of recidivism fully satisfying the recommendations in the current literature, such as, Technical Report No. 10 of the

SEARCH GROUP to U.S. Department of Justice, Moberg and Ericson (1972), Martinson (1974), Gendreau (1976), André Normandeau (1982), etc.

The potential of the FPS/CPIC data bases and its actual workability would be clearly understood only with reference to an exact formula for quantification and measurement of recidivism and the variables that enter into it. Even then, since the CR2 file, containing most of the required information, is in a free-form verbal context, considerable ancillary works; such as coding the range of values of the variables, generation of new variables as function of those entered into FPS/CPIC, linking with OIS, etc.; would have to be done to make the data bases useful.

In short, it may be pointed out that full details of FPS/CPIC data base, as to how they are collected, defined, coded, transformed, entered, updated, etc. is not fully known to a researcher. Further, the confidentiality and the consequent administrative constraints on accessibility to it, makes it all the more difficult to use the data base for follow-up and recidivism studies. To be able to understand the full potential of the data base for recidivism research, a separate and detailed study would have to be undertaken.

4. CURRENT PRACTICES

4.1 INTRODUCTION: In this section we will describe the current practices in the Ministry with regard to the computation of certain success or failure rates among the inmates conditionally released.

Historically, a large number of formulae or methods have been tried from time to time by the National Parole Board and Correctional Service of Canada. Some of these rates which describe events over a short period, easy to compute and interpret, have been used primarily for the Ministry Annual Reports and media releases. The others, based on longitudinal data have been computed to help research, evaluation, and policy development.

We will examine in detail one such short term rate known as "Successful Parole Termination Rate" and the other, more powerful measure derived from long term follow up studies.

Finally, we will list the various formulae tried in the past.

4.1.1 SCHEMATIC DIAGRAM AND SYMBOLS: A crime career might be viewed as a kind of a continuous feedback system on a time path. From the point of time an individual is arrested for committing an offence, his time path is dotted by all kinds of incidents such as charge, trial,

conviction, incarceration, release, repeat-offence, escape, death, transfer, etc. - to name a few. For an understanding of the implications of the various kinds of rates and measures usually calculated, it is very helpful to have a visual display of the time path by a horizontal line and the incidents by a number of symbols. We therefore present and explain such a schematic diagram below.

TABLE 4.1.1

DIAGRAMATIC PRESENTATION AND SYMBOLS

DIAGRAM/SYMBOL	EXPLANATION
25/7/78 (=t_i)	Indicates time point t_i when an inmate has been released conditionally, such as on full parole, mandatory supervision, etc. In this case t_i is July 25, 1978. The subscript i=0,1,2,3,... etc. will denote different time points.
$\rightarrow t_1$	Indicates successful termination on reaching the warrant expiry date (which is t_1 in this case).
$\hookrightarrow t_2$	Indicates readmission owing to parole/MS failure on the date t_2.
$\rightarrow t_3$	Indicates exit from the penitentiary (or the crime career) owing to transfer, death, or escape on the date t_3.
$\dashv t_4$	Indicates reaching a time point t_4 without any event. In other words, still on parole/MS status and no termination upto the time point t_4.

4.2 SUCCESSFUL PAROLE TERMINATION RATE: Table 4.2.1. shows the total number of federal parole terminations in a given year and the percentage of the terminations due to successful completion (i.e. reaching warrant expiry date (WED)).

TABLE 4.2.1

NUMBER OF FEDERAL PAROLE TERMINATIONS AND PERCENTAGE OF SUCCESSFUL COMPLETION

YEAR	PAROLE		
	TOTAL TERMINATED*	COMPLETED SUCCESSFULLY	
		NUMBER	PERCENTAGE
1975	1,358	912	67.2
1976	1,217	851	69.9
1977	1,020	722	70.8
1978	1,090	814	74.7
1979	1,243	877	70.6

* Excludes termination by death.

SOURCE: NPSIS data base: Research & Evaluation Section, National Parole Board

The National Parole Board used to compute these "successful parole termination rates" by using the formula -

[1] $$\frac{\left[\text{Number of successful Termination (ie. reaching WED)}\right] \times 100}{\text{Number of terminations due to all causes}}$$

This formula had the following drawback:

The unit of observation in this formula is a "termination" and by definition each termination can take only one of the two values, namely, due to reaching WED, or due to causes other than reaching WED. All "terminations" satisfying this definition constituted the population of observations.

Let us now consider a case whose WED falls beyond the year under consideration. Such a case can take only one value, namely, termination due to causes other than reaching WED. This means that many "non-failures" are excluded simply because their termination (WED) dates are still in the future. Thus, in effect the number in the numerator and the number in the denominator are derived from two different populations. Hence division of the former by the latter is not meaningful.

The correct formula for computing such successful parole termination rate would be -

$$[2] \qquad \frac{\left[\begin{array}{l}\text{Number of successful terminations for}\\ \text{cases whose WED is within the given year}\end{array}\right]}{\begin{array}{l}\text{Number of teminations due to all causes}\\ \text{for those cases whose WED is within the}\\ \text{same given year.}\end{array}} \times 100$$

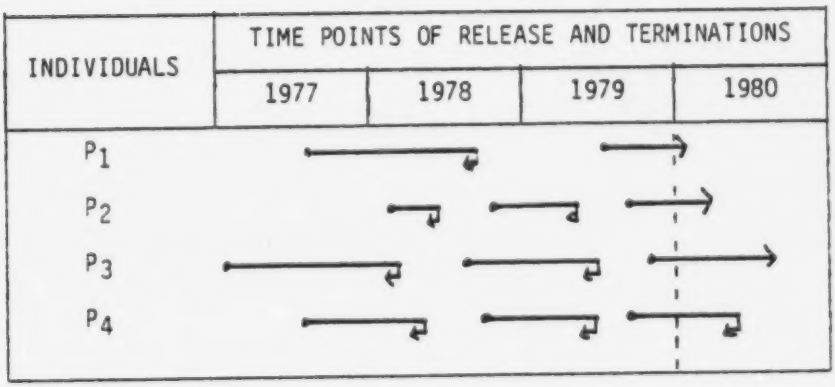
Currently, the National Parole Board is using this formula for publication of the rates in the Ministry's Annual Report. Although this formula is more logical, it still suffers from the following drawbacks:

(i) This rate gives only one sided information, namely, about those cases for whom the parole decisions were affirmative. It does not tell anything about those parole decisions that were negative. To evaluate the justifiability of the negative decisions one would have to actually conduct an experiment by releasing the corresponding group of inmates and demonstrating that a large proportion of them do fail to reach their WED successfully. Admittedly, this is not possible in practice, but the point is worth remembering that such a rate cannot be used for the purpose of evaluating parole decisions in general, both affirmative and negative.

(ii) The denominator represents total number of "revocations" and no distinction is made between revocations with or without a new indictable offence. Since revocation with a new offence is understood by many as a "failure" in the true sense of the term, the "failure rate", if computed from the same body of data will not be complimentary to the "successful rate".

(iii) Sometimes, the above successful termination rate is understood or interpreted as some sort of an indicator or measure of parole recidivism. This is not justified simply because the unit of observation is a "termination". For the purpose of a measure of recidivism the unit of observation has to be an "individual". This subtle difference can be easily seen by referring to the diagram below.

DIAGRAM 4.2.1



Let us assume that WED of each of the 4 individuals was in 1980. There were 5 terminations in 1980, out of which 3 were due to reaching WED successfully. Hence -

(Successful parole termination rate) = 3/4 = .75 or 75%. This rate 0.75 is no doubt an indicator of the justifiability of the immediately preceding parole decisions with regard to the release of these 4 individuals.

But it is not an indicator of the performance of the 4 individuals with regard to the event of "falling back into prior criminal habits". For such an indicator the unit of observation would have to be the "individual". And we would have to count the total number of failures contributed by this group of 4 individuals, which is 8 in this case. This number 8 or better, the average number of failures contributed by each individual - which is 2 in this case - is a logical indicator or description of the performance of the group.

Thus the conclusion about the "successful parole termination rate" is that if it is computed by the correct formula [2], it does serve the purpose of measuring the justifiability of the affirmative parole decisions. It does not serve any other purpose.

4.3 **FIVE YEAR FOLLOW UP STUDIES OF THE NATIONAL PAROLE BOARD:** The following table is an example of the results of 5 year follow up studies of the National Parole Board.

TABLE 4.3.1

FIVE YEAR FEDERAL PAROLE RELEASE FOLLOW UP: 1975-79

TOTAL NUMBER RELEASED IN 1975	SUCCESSFUL COMPLETION ON REACHING WED		TOTAL REVOCATIONS WITH/WITHOUT OFFENCE (I.E. FAILURES)		OTHERS*	
	#	%	#	%	#	%
1286	729	60.6	367	28.5	140	10.9

* Includes 1 death, 24 terminations for reasons other than successful completion or revocation, 115 still under supervision.

SOURCE; NPSIS Data base: National Parole Board.

The rate i.e. percentage of failure - in this case 28.5 - is interpreted as a measure of recidivism in this group of 1286 inmates. This is a typical example of follow up studies and the practice of computing the "failure rate". However, such failure rates are not adequate fo the following reasons.

(i) Usually, an error of computation arises from the fact that the importance of a rigorous definition of "population" under consideration, and the "event" whose occurrence is identified as "relapse", is not well recognized. For example, with regard to the above follow up study let us define these two concepts as below.

> POPULATION: Federal inmates released on full parole during 1975 such that each one of them has been observed upto the end of the observation period or his warrant expiry date, and who can be associated with the occurrences, if any, of the event identified as a "relapse into prior criminal habits".
>
> EVENT: Termination of full parole due to revocation with or without offence resulting in readmission to prison.

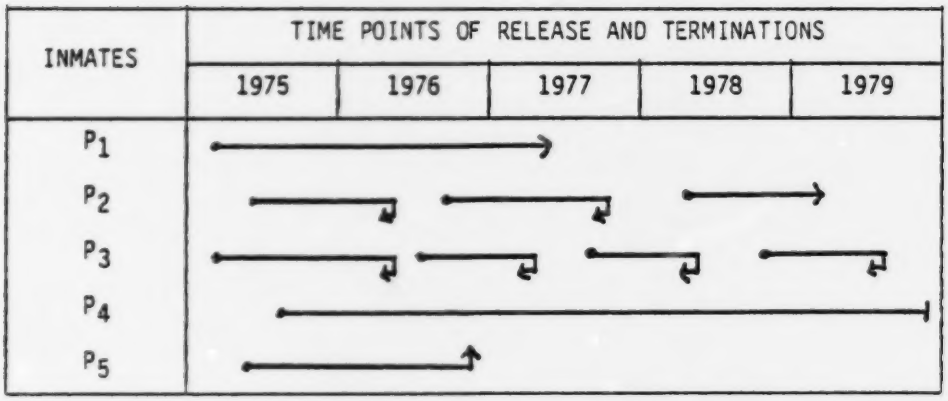
Under these definitions, the person who died and the 24 persons removed due to "other" causes, should be excluded from the population. These persons, in fact, made "exits" from the system. Hence, the the effective population size is 1286-25=1261, and the correct failure rate is (367÷1261) x 100 = 29.1%.

(ii) The consensus among the crime and Justice Community, in general, is that one should try to extract as much information as possible with regard to the "failures" among a group of inmates, conditionally released and observed over a given period of time. The first important information with regard to each inmate is whether he had "failed". The failure rate 29.1% simply gives us a count (in terms of percentage) of these inmates.

The next important information is that, if an inmate had failed, did he fail only once? If not, how many times? This information, although retrievalbe from the follow up data, is not provided by the above mentioned method of computing failure rate. In other words the frequency of failures is also an important piece of information.

In the absence of this information, not only we have an incomplete picture but also, comparison of two groups under study will be misleading in most cases. This point can be best explained by referring to the diagram below.

DIAGRAM 4.3.1



Given such a body of follow up data for a population of 5, the conventional approach for computing the recidivism rate would be as below:

Effective population size = 4

Number of inmates classified as failures (i.e. P_2 and P_3) = 2

Therefore failure rate = 2÷4=0.5 or 50%.

The information contained in this body of data, not taken into account, is the total number of failures occurring in the population, which is 6 in this case.

Consider another population of size 4 where the number of inmates classified as failures is 2, but the total number of failures happens to be 10. The failure rate in this population would be computed as 2÷4=0.5 or 50%. Hence, one would conclude that the degree of recidivism in this population is same as in the previous one, which is obviously erroneous. Because the recidivism in the second population, with a total of 10 failures, is certainly greater than the recidivism in the first population with a total of 6 failures.

(iii) Another problem inherent in the conventional approach is classificatory. For example in the diagram 4.3.1 the inmate P_2 had two initial failures, but finally he reached his warrant expiry date successfully. Should we count him as a case of success or a case of failure?

(iv) Still another problem with the kind of follow up data referred above is that we cannot observe an inmate once he has reached his WED and has been released in the society. In other words, period of observation while under conditional release, do differ from inmate to inmate. Still, these differences are not taken into account in the usual follow up studies.

4.4. OTHER METHODS OF COMPUTING SUCCESS OR FAILURE RATES: There are a number of other methods or formulae that have been tried by the National Parole Board and Correctional Service of Canada over the past years, in an effort to evaluate parole granting decisions or to quantify and measure recidivism among the parolees.

All these formulae have been found unsatisfactory and are no longer in use. Without going into any detailed discussion about their nature or inadequacy, we will simply list them here for the purpose of general information.

Formula 1: $\frac{\text{Parole violation decisions}}{\text{Parole grant decision}} \times 100$ (annual)

Formula 2: $\frac{\text{Parole violations}}{\text{Parole terminations}} \times 100$ (annual)

Formula 3: $\frac{\text{Parole violations}}{\text{Average number of parolees under supervision}} \times 100$ (quarterly)

Formula 4: $\frac{\text{Parole violations}}{\text{Total population at risk}} \times 100$ (annual)

Formula 5: $\frac{\text{(Total terminations in a year)} - \text{(Total return to prison)}}{\text{Total terminations}} \times 100$ (Annual)

Formula 6: $\frac{\text{Parole violation within one year of release}}{\text{Total inmates released in the year}} \times 100$ (annual)

5. APPROPRIATE MEASURE OF RECIDIVISM

5.1 INTRODUCTION: Controversies, raging so long, over the question of a conceptually rigorous but operationally feasible measure of recidivism, are resolvable. In this section, we shall show how these controversies can be resolved based on certain generalised concepts and a few computational procedures. We will then develop a simple procedure or formula for the computation of an indicator of recidivism which minimizes the limitations of previous practice.

As an illustration, we will compute such an indicator of recidivism among the 3353 federal parolees released during 1976 and followed up to June 30, 1980, by using the Offender Information System data base.

Finally, we will provide some technical discussions for possible refinements of the basic formula depending on the needs of the user.

5.2 NATURE OF CONTROVERSIES: The controversies revolve around two basic questions. The first one is what constitutes "a falling back or relapse into prior criminal habits"? For example, as emphasized throughout, to the police a "rearrest" would mean a relapse into criminal behaviour. To the court a "reconviction" would mean a relapse into criminal behaviour. To a correctional agency a "reincarceration" would mean a relapse into criminal behaviour. And so on.

The second question is what are the distinct factors that are perceived, to be associated with this phenomenon of "falling back or relapse"? It is not enough to observe merely whether one had or had not a "relapse". At least three additional factors or dimensions associated with this phenomenon should be taken into account for an adequate description or quantification of recidivism:

(i) "Relapse" may be repetitive; there can be more than one relapse.

(ii) There are variable periods of time preceding relapse. Such time periods have to be taken into account (SEARCH GROUP: Technical Report No. 10: For U.S. Department of Justice).

(iii) "Relapses", vary in terms of their seriousness. A petty offence like bicycle theft and an offence like murder or rape should not be considered as equivalent exmples of relapse. (Martinson: 1974, Gendreau: 1976, SEARCH GROUP: Technical Report No. 10).

5.3 SOLUTION: We will now show how these controversies can be resolved in terms of a generalized concept of recidivism and a few computational procedures.

5.3.1 GENERALIZED CONCEPT OF RECIDIVISM: The term recidivism need not be understood only in terms of relapse "into prior criminal behaviour". Rather, it should be underestood in terms of returning to any "previous behaviour mode" (Stollmack: 1974). To put it another way, recidivism should be understood in terms of two well defined entities, namely, a "population" and an "event" such that with each member of the population - while under observation - the event may not occur at all; may occur once; may occur more than once.

EXAMPLE 1:

POPULATION: All inmates from federal penitentiaries who are on full parole status on January 1, 1979.

EVENT: The incident of commitment of an offence under criminal code resulting in rearrest of the offender.

EXAMPLE 2:

POPULATION: All inmates from federal penitentiaries reaching successfully their warrant expiry date, during 1978.

EVENT: Commitment of an offence resulting in reconviction after an inmate is released into society on completion of his sentence.

EXAMPLE 3:

POPULATION: All heart patients released from Ottawa Civic Hospital during 1978.

EVENT: The occurrence of a heart attack resulting in rehospitalization.

In each of the above examples we can think of "recidivism" in a given "population" with respect to the recurrence of the "event" under concern. In other words, instead of arguing as to what constitutes a relapse or failure, it is better to accept and understand the reconceptualization of recidivism in terms of well defined "populations" and "events". And depending on the user's need one can then compute a rate or any other suitable measure of recidivism with respect to the recurrence of that "event" in the "population" under concern. Obviously, the recidivism measure would differ from different "events" and different "populations".

5.3.2 TIME UNDER RISK: Since we are interesteed to assess the criminal activity of an inmate while he is under conditional release, we will define the length of time that he actually spends under conditional release as the "time under risk". The length of time i.e. the value of the variable "time under risk" varies from member to member. These values cans be easily computed for each member as can be seen with reference to the data matrix shown in Table 3.2 or to a hypothetical case shown in the diagram below.

For example, in this case,

Time under risk = T = $(t_1-t_0)+(t_3-t_2)+(t_5-t_4)$

5.3.3 FREQUENCY OF RELAPSE: The number of times the event occurs i.e. the frequency of relapses for each member of the population can be computed from the basic data matrix. For example, in the above hypothetical case the frequency of relapses is -

$$f = 2$$

5.3.4 TIME TO RELAPSE: With each relapse of the event there is a distinct length of time that precedes it. For each member of the population, the total time that preceded before all the relapses can be easily computed. For example, in the above hypothetical case the total length of time elapsed before the two relapses will be given by -

Total time to relapse = t = $(t_1-t_0)+(t_3-t_2)$.

5.3.5 SEVERITY OF RELAPSE: Everything else remaining same, suppose A's relapse was due to commitment of rape and B's relapse was due to commitment of a theft of twenty dollars. In this case we want to say that A's recidivism is greater than that of B, because there is a general consensus that rape is a more severe offence as compared to twenty dollar theft.

To explain the method being recommended to indicate the level of seriousness of the recommitted offences of the group, let us suppose that we choose 21 categories of offences $C_1, C_2, \ldots C_{10}, C_{11}, C_{12}, \ldots C_{21}$ such that C_1 is murder, C_2 is rape, C_3 is burglary, etc. Although it is not possible to assign a numerical value of severity to C_1, C_2, etc., it is by and large possible to say "C_1 is more severe than C_2, and C_2 is more severe than C_3, etc.". In other words, it is possible to rank order the categories of offences as shown below:

$$C_1 > C_2 > \ldots > C_{10} > C_{11} > C_{12} > \ldots > C_{21}$$

We thus know that C_{11} is our "median" severe offence category. It is then possible to identify all the recommitted offences (i.e. relapses) observed among the members of a population and sort out "s" of them which

happen to be above the median severe offence category C11. If f is the total number of recommitted offences, then the proportion s/f = $\tilde{s}$ (suppose) can be used as an indicator of severity of the recommitted offences by the members of the population under observation.

5.4 **INDICATOR OF RECIDIVISM:** It is possible to retrieve from the existing OIS data base - regarding each inmate of a group under conditional release - such information as:

(i) time spent under risk (i.e. under conditional release),
(ii) frequency of failures (i.e. relapses),
(iii) time expired before each relapse,
(iv) severity of each relapse,

considered as necessary dimensions, to be taken into account, for constructing a measure of recidivism.

More generally, suppose we have compiled the following data with respect to the relapses of any well defined "event" among the members of a well defined population/sample, observed over any given period of time:

N = Total number of members in the population/sample

T = Total length of time (the unit can be day, month, or year) they were exposed to risk

n = Number of members who had one or more relapses

f = Total number of relapses in the population

t = Total length of time (in units of days) expired before all the relapses.

s = Total number of relapses ranked above the median category of the severity of relapse.

$\bar{T} = \frac{T}{N}$ = Average length of time each member was exposed to risk

These data can be further condensed as below -

$\tilde{n} = \frac{n}{N\bar{X}T}$ = Proportion of members having one or more relapses per unit of time exposed to risk

$\tilde{f} = \frac{f}{N}$ = Number of relapses per member of the population

$\tilde{t} = \frac{t}{f}$ = Average length of time expired before each relapse

$\tilde{s} = \frac{s}{f}$ = Proportion of relapses above the median category of the severity of relapse

The set of numbers $(\tilde{n}, \tilde{f}, \tilde{t}, \tilde{s})$ serves the purpose of describing the performance of the "population" with respect to the relapses of the "event" under concern.

For the sake of convenience let us write -

$$(5.4.1) \qquad I = (\tilde{n}, \tilde{f}, \tilde{t}, \tilde{s})$$

where I is defined to be an indicator or measure of recidivism in any given "population" with respect to any "event", in the sense that it extracts and presents the most important informations contained in a given body of follow up data with regard to the re-occurrences of the "event" under concern.

It may be worthwhile here to reiterate certain aspect of the issue of "seriousness" which arises from the contention that a simple count of offences is not an adequate description of "criminality" in a society. Considerable research in the past has been directed towards constructing some sort of a standardized scoring system for each offence type or offence category. The underlying assumption is that there is a "scale of severity" - although unknown - which would enable us to assign a number to each offence or offence category such that these numbers satisfy the properties of ratio scale. A sum of these numbers or scores would then describe criminality

numerically. Such scales constructed by various authorities have led to controversies on various grounds, namely, additivity, procedural complication, subjectivity, unsuitability for universal application, etc.

To obviate these difficulties we proposed an alternative approach based on rank order method of offence categories in section (5.3.5). The approach is more objective, operationally simple, and does serve the purpose of giving an idea of the level of seriousness of the recommitted offences by the members of a group.

However, some operational agencies may prefer to use an indicator which is still simpler to compute and comprehend and may be willing not to capture any information regarding seriousness of the recommitted offences. In that case the next best option is to compute and present only three components of the indicator in the form -

$$(5.4.2.) \qquad I = (\tilde{n}, \tilde{f}, \tilde{t})$$

where $\tilde{n}$, $\tilde{f}$, $\tilde{t}$, has the same meaning as explained earlier.

5.5 **AN ILLUSTRATION:** We will now present here the results of computation of the indicator $I = (\tilde{n}, \tilde{f}, \tilde{t})$ for 3353 federal inmates who were released on full parole or mandatory supervision during 1976 and followed up to June 30, 1980. These 3353 inmates constitute our "population" of interest.

The "event" under concern is defined as revocation of parole or mandatory supervision due to indictable or summary offence resulting in readmission to the penitentiary. Each occurrence of this event is considered to be a "relapse".

By looking at the basic data matrix retrievable from the OIS data base, and illustrated under Table 3.1, one can see that it is easy to compute the values of n and T_i, f_i, t_i, for the ith inmate where i = 1, 2, ... 3353. Summing up over i (i.e. inmates) we obtain -

$$N = 3353$$

$$n = 1356$$

$$\sum T_i = T = 809969 \text{ days} = 2{,}219 \text{ years}, \quad \bar{T} = \frac{2{,}219}{3353} \simeq 0.6618 \text{ years}$$

$$\sum f_i = f = 2124$$

$$\sum t_i = t = 549473 \text{ days}$$

We can then compute:

$$\tilde{n} = \frac{n \times 100}{N \times \bar{T}} = \frac{1356 \times 100}{3353 \times 0.6618} \simeq 61$$

$$\tilde{f} = \frac{f \times 100}{N} = \frac{2124 \times 100}{3353} \simeq 63$$

$$\tilde{t} = \frac{t}{f} = \frac{549473}{2124} \simeq 259$$

and write -

$$I = (61, 63, 259)$$

where I is the indicator of recidivism among the population of 3353 inmates.

INTERPRETATION: It must be remembered that the sole purpose of constructing an indicator (or index) is nothing more than to provide us with certain required information, in a summarized and comparable way, from a huge body of data which is otherwise incomprehensible.

The above indicator I = (61, 63, 259) does exactly the same thing, namely, it provides us wiht certain pertinent information about the 3,353 inmates with regard to the phenomenon of "relapse into prior criminal habits".

(i) The first component 61 tells us that on an average, out of every 100 inmates exposed to risk for one year, 61 had failed (the conversion to "per 100 inmates, per year" is necessary for the sake of comparability with other follow up data). The unit of count here is an inmate.

(ii) The second component gives us another information, namely, every 100 inmates in the group observed over a period of 4 years, contributed to (i.e. were responsible for) a total of 63 failures. The unit of count here is a "failure" i.e. "relapse".

(iii) The third component tells us that, on an average, the length of time expired before each one of these failures was 259 days.

5.6 **TECHNICAL NOTES:** For any given body of follow up data the indicator $I = (\tilde{n}, \tilde{f}, \tilde{t}, \tilde{s})$ or its simpler version $I = (\tilde{n}, \tilde{f}, \tilde{t})$ is perfectly general and the procedure for its computation remains exactly same as illustrated earlier. However, it is important to explain here a few technical aspects so that any operational agency, primarily concerned with the policy and program evaluation, can make appropriate use of the above formulae under certain special circumstances.

5.6.1 IF THE DATA IS FROM DIFFERENT POPULATION/SAMPLE: It is necessary to ascertain if a given body of data has, in fact, been recorded from one single population or from a mixture of two or more different populations.

More specifically, let us assume that the total number of N inmates followed up can be divided into two groups of N1 and N2 ($N1+N2=N$) such that the inmates comprising N_1 are criminally very much active and likely to fail more frequently. On the other hand most of the inmates comprising N_2 are not likely to fail at all or fail hardly one or two times. In such a situation if we compute $\tilde{f}$ which is the number of failures per inmate, it will show a downward bias for the group N1 and an upward bias for the group N_2.

Under such a situation, a rigorous procedure would be to compute -

$\tilde{f}_1$ = Number of failures per inmate among the group N1

$\tilde{f}_2$ = Number of failures per inmate among the group N2.

and then test whether the actual observed difference $(\tilde{f}_1 - \tilde{f}_2)$ is statistically significant (There are various parametric as well as non-parametric statistical tests available for doing this). If it is not significant then we are perfectly justified to compute just one indicator $I = (\tilde{n}, \tilde{f}, \tilde{t})$ for the N inmates as a whole. On the other hand if the difference $(\tilde{f}_1 - \tilde{f}_2)$ happens to be statistically significant then it is advisable to compute two indicators $I_1 = (\tilde{n}_1, \tilde{f}_1, \tilde{t}_1)$, $I_2 = (\tilde{n}_2, \tilde{f}_2, \tilde{t}_2,)$, separately for the two groups of N_1 and N_2 inmates.

This situation can also arise with respect to the other variable, namely, the length of time preceding each failure. The inmates among the group N_1 may fail repeatedly after very short periods of time. On the other hand the inmates among the group N_2 may take very long time if they fail at all. In other words computing the value $\tilde{t}$ for the N inmates would show upward bias for the group N_1 and downward bias for the group N_2.

In this situation we would have to follow exactly the same procedure, namely, we would have to test the difference (t_1-t_2) for the two groups. If this difference is not statistically significant we would be justified in computing just one indicator I, otherwise we would have to compute two indicators I_1 and I_2, separately for the two groups of inmates N_1 and N_2.

This type of situation, namely, the observed longitudinal data are in fact from two or more different populations, is conceivable. Three examples are given below:

EXAMPLE 1: N_1 could be the number of inmates released under MS and N_2 could be the number of inmates released under full parole.

EXAMPLE 2: N_1 could be the number of inmates serving short periods of sentences and N_2 could be the number of inmates serving much longer periods of sentences. Hence, frequency of failures is likely to be much less among the group N_1 as compared to that among N_2.

EXAMPLE 3: N_1 could be the number of inmates whose criminal records and other characteristics (such as younger age) are quite different from those of N_2 inmates. Hence frequency of failures is likely to be much more among the group N_1 as compared to that among N_2.

5.6.2 USER'S DEFINITION OF THE "EVENT": Under Section 5.3.1 we had explained why it is desirable to reconceptualise recidivism in terms of a well defined population and a well defined event. Choosing or defining the appropriate "event" which will best serve the purpose of understanding, describing, or evaluating the effects of correctional programs, is an important decision that depends on the user.

For example, a manager of correctional program may decide to distinguish between the first failure and the subsequent failures among the inmates under conditional release. He may argue that all that he wants to know is, if an inmate had failed - no matter whether he failed once or 100 times.

In that case what he is really asking for, is a change of definition of the event as "first failure" only. Such a change of definition leads to nothing more than special cases of the general formulae (5.4.1) or (5.4.2) derived under section 5.4.

More specifically, in this case we would have to compute the following quantities:

N = Total number of members in the population/sample

T = Total length of time (the unit can be day, month, or year) they were exposed to risk.

n = Number of members who had one or more relapses (= The number of first relapses).

$\bar{T} = \frac{T}{N}$ = Average length of time each member was exposed to risk.

t' = Total length of time (in units of days) expired before the <u>first relapses</u> / t.

Note that these quantities are identical with those defined under Section (5.4) except that we are no longer computing total number of relapses in the population (i.e. f) and the quality t' is different from the earlier t.

From these quantities we would further derive -

$\tilde{n} = \frac{n}{N \times \bar{T}}$ = Proportion of members having first relapses (same as one or more relapses) per unit of time exposed to risk.

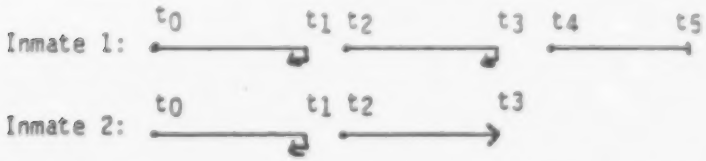
$\tilde{t}' = \frac{t'}{n}$ = Average length of time expired before the <u>first relapse</u>.

The new indicator of recidivism with respect to the event of "first failure (i.e. relapse)" would then be given by

(5.6.1) $I' = (\tilde{n}, \tilde{t}')$

which is merely a special case of the general formula (5.4.2)

5.6.3 TIME UNDER RISK: Under the Section (5.3.2) we had defined time under risk as the time actually spent by an inmate while he was under conditional release. It may be argued that we are interested to know about the "relapse into criminal activity" not only when an inmte was out of the prison but also when he was in it. Again, this is a question of definition that has to be decided by the user. With this definition, the time under risk would have to be computed as shown in the diagram below.



For inmate 1, and 2, the times under risk would be given by (t_5-t_0) and (t_3-t_0), respectively. Summing over all the inmates we would merely get a different number T'

representing the total time under risk. The general form of the formula, derived under Section 5, would remain exactly the same.

The important point to note is that the "time under risk" varies from inmate to inmate. Hence, it is necessary to compute this quantity for the purpose of conversion of the indicator per unit of time and thereby ensure comparability of different groups under study.

6. CONCLUSION

The term "recidivism" is commonly understood, in the crime and justice community, as a falling back or relapse into prior criminal habits, especially after punishment. An extensive literature exists on the subject based on this notion.

A portion of these studies is directed towards theoretical aspects such as developing a most suitable mathematical model to describe the incidence of recidivism over time; discovering dependence relationship, if any, between prior histories and other characteristics of the offenders and the observed incidences of recidivism; trying to predict the incidence of recidivism using such relationship model, etc. These studies, no doubt, have their own merits.

However, a large part of these studies is also directed towards a more mundane question, namely, what exactly is meant or should mean by "a falling back or relapse into prior criminal habits" and is this criterion alone, sufficient enough for the purpose of describing recidivism by some quantified measure? There is great diversity of opinions on this question and in fact an acceptable, unique answer to this question has so far eluded the social researchers and the administrators of justice and correctional programs.

In this report we have thoroughly investigated into this question and developed a most defensible solution to this problem. This, has been done in four steps. First: we have presented a synopsis of the central ideas of major studies in the past in a form convenient for the general reader. Second: we have described the existing Ministry data bases and examined their potential for the purpose of actually computing a most suitable recidivism measure. Third: we have also examined the merits and demerits of the recent practices within the Ministry of computing certain success or failure rates among the inmates conditionally released. Finally, we have analyzed the exact nature of the existing controversies towards quantification and measurement of recidivism and have shown that they are resolvable through certain generalization of the concept of recidivism. In particular, it has been pointed out that recidivism need not be understood in terms of "all-or-none criterion of success and failure" and should be conceptualized as more than a binary classification. By now, it is the general concensus among the crime and justice community that at least three other factors, namely, frequency of relapses (i.e. repeat offences), time taken to relapse, and "severity" (in some sense) of relapses must be taken into account for an adequate description and measurement of recidivism. In this report we have developed a formula and procedure for computation of a recidivism indicator that takes into account all these fators. The operational feasibility and the computational ease of such an indicator has been illustrated with reference to 3,353 federal inmates released on full parole or mandatory supervision during 1976

and followed up to June 30, 1980. It has been shown that this method of computing a recidivism indicator is perfectly general and flexible, and can be easily adapted to different user requirements.

In conclusion, and based on the findings in this report, we may stress on the desirability of computation of an improved indicator of recidivism - among the federal inmates conditionally released each year - as an annual series. Such a time series of recidivism indicator can be used for media release and publication in the Annual Report of the Ministry. It can also be an aid towards a better understanding and description of the results of various correctional programs. And lastly, it will be of help, as a methodological development, to the crime and justice research community in general.

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